

REMARKS

Applicants thank the Examiner for the thorough consideration given the present application. Claims 6, 7 and 9-12 are currently under consideration. Claims 3 and 8 have been withdrawn from consideration. The Examiner is respectfully requested to reconsider his rejections in view of the amendments and remarks as set forth below.

REJECTION UNDER 35 U.S.C. §112

Claims 6, 7 and 9 stand rejected under 35 U.S.C. §112, first paragraph as failing to comply with the written description requirement. The Examiner objected to the word "continuously" in regard to the secondary grooves. By way of the present Amendment, Applicants have removed this word from all three claims. Accordingly, this rejection is rendered moot.

REJECTION UNDER 35 U.S.C. §103

Claim 9 stands rejected under 35 U.S.C. §103 as being obvious over Ishikawa et al. (U.S. Patent 5,915,467) in view of Shikazono et al. (U.S. Patent 5,803,165). This rejection is respectfully traversed.

The Examiner states that Ishikawa et al. discloses a heat transfer pipe having two rows of substantially parallel grooves of differing width on either surface of the pipe body. The Examiner concedes that the Ishikawa et al. patent does not disclose the secondary grooves.

The claims of the present application set forth a combination of method steps and elements wherein the first and second rows contact one another to form regions of V-shaped patterns. The claims clearly define over the Ishikawa et al. patent which does not disclose this feature. Applicants submit that the claims of the present application are unobvious over the disclosure set forth in the Ishikawa et al. patent. The Examiner's rejection has been obviated.

The Examiner relies on Shikazono et al. to show the secondary grooves and refers to Figure 17a. However, Applicants submit that the claims of the present application are directed to a combination of elements wherein the grooves are fine grooves having a small width compared to the radial direction of the projection portions. As seen in Figure 8 of the present application, the secondary grooves are very small in width. This is not the case with the groove shown in Figure 17a of the Shikazono et al. reference. Accordingly, Applicants submit that the claims of the present application are unobvious over the disclosure set forth in the Shikazono et al. patent. Further, it is noted that the claims describe the secondary grooves as extending from one side surface to the other side surface thereof. While Figure 17a of the Shikazono patent shows the grooves starting half way up the side of the projected portions, they do not extend the full height of the projected portions.

Claims 6, 7 and 9 stand rejected under 35 U.S.C. 103 as being obvious over Sasaki et al. (JP 10-300379) in view of Shikazono et al. This rejection is respectfully traversed.

The Sasaki et al. reference shows a heat exchanger tube similar to that of the Ishikawa et al. in that the rows of grooves are separated by an ungrooved portion. Applicants submit that this patent does not render obvious the combination of method steps and elements as set forth in the claims wherein the first and second rows contact one another to form regions of V-shaped patterns. Accordingly, Applicants submit that this rejection is overcome for the same reason recited above in regard to the Ishikawa et al. reference.

Also, Applicants submit that the Shikazono et al. reference does not teach the secondary grooves being fine grooves as explained above. Accordingly, Applicants submit that this rejection is overcome for these reasons as well.

Claims 6, 7 and 9 stand rejected under 35 U.S.C. §103 as being obvious over Kiyotani (JP 09318288) in view of Shikazono et al. This rejection is respectfully traversed.

The Examiner states that Kiyotani fits all of the claims limitations except the secondary grooves. The Examiner relies on Shikazono et al. to show the secondary groove arrangement. Applicants submit that this rejection is overcome in that Shikazono et al. does not show the fine grooves as explained above.

Concerning the Kiyotani reference, it is noted that this reference is in the Japanese language and accordingly it is assumed that the Examiner is relying on the abstract and figures as a basis for the rejection. If the Examiner is relying on a translation, he is requested to provide the same to Applicants.

The Examiner has referred to Figure 5b to show the claimed limitations. It appears from this figure that alternating rows of parallel grooves are arranged around an inner surface of a pipe. However, it is not completely clear, due to the size of the drawing whether the individual grooves in adjacent rows actually contact each other or not. It is also not clear whether the rows actually contact each other or whether there is an open area such as in the Sasaki and Ishikawa et al. references. It is noted that the Abstract refers to "the imaginary interface lines" between the rows. It is not clear whether the grooves on each side of the line actually contact each other to form V-shapes or not. If the Examiner persists in this rejection, he is requested to point out the basis for which he feels that the rows contact each other and the grooves contact each other to form V-shaped patterns. Applicants submit that the reference does not teach this in the Abstract and Drawings.

Applicants have also added dependent claims 10-12 which describe the secondary grooves as each having a rectangular shape. This rectangular shaped secondary groove is superior in efficiency of heat exchange to the triangular shaped groove shown in Figure 17a of the Shikazono et al. Accordingly, Applicants submit that these claims are additionally allowable.

PROSECUTION HISTORY ESTOPPEL

Claims 6, 7 and 9 are hereby presented in independent form. No prosecution history estoppel would apply to the interpretation of the limitations set forth in claims 6, 7 and 9 and the claims that depend therefrom in view of the fact that this subject

matter has been continuously presented since the original filing date of the present application.

CONCLUSION

In view of the above, it is believed that the claims clearly distinguish over the patents relied on by the Examiner, either alone or in combination. In view of this, reconsideration of the rejections and allowance of all the claims are respectfully requested.

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Respectfully submitted,

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